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HERLA

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EXAMINER

GATES, ERIC ANDREW

ART UNIT

PAPER NUMBER

3722

DATE MAILED: 10/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.



### **DETAILED ACTION**

1. This office action is in response to the Attorney Initiated Interview of 24 October 2006. This office action replaces the action mailed 11 August 2006 in its entirety, and is meant to correct the use of the Wehrfritz Patent Publication, which utilized an improper 102(e) date, by applying the one of the German Patents from which the Wehrfritz application was derived.

### ***Drawings***

2. The drawings are objected to because they contain new matter not supported by the original disclosure. Thus, while the original specification describes an alternative embodiment of the invention in which the drive shaft has a tube that extends into a central bore of the tie rod, there was no detail provided as to the structure required to meet this limitation. Therefore, newly submitted figure 3, directed to the subject matter of claim 5, includes new matter that was not presented in the original disclosure, as it displays details not disclosed in the original application, and hence must be canceled to overcome this objection. An amendment to the specification to cancel any reference to this figure is also required.

3. Upon cancellation of figure 3, the drawings will be objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the drive shaft having a tube extending into the central bore of the tie

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rod of claim 5 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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5. Claim 5 is rejected under 35 U.S.C. 102(b) as being anticipated by Sugata (U.S. Patent 5,676,506).

6. Regarding claim 5, Sugata discloses a spindle unit for a machine tool, comprising: a drive unit 50 having a drive shaft 46; a spindle head 1 assembly constructed for receiving a tool 2 and having a hollow spindle head shaft 48 driven by the drive unit 50; a tie rod 44 arranged for axial displacement in the hollow spindle head shaft 48 (claim does not require that the tie rod be axial displaced from the spindle head shaft, only that it be arranged for axial displacement and be in the spindle head shaft) and mechanically coupled with the drive shaft 46; and a shifting unit 51a for axially moving the drive shaft 46 together with the tie rod 44, wherein the tie rod 44 has a central bore for transporting lubricant, said drive shaft 46 having a tube 12 extending into the central bore and being removable therefrom.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 2, 4, 7, 8, 10, 11, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller (German Patent DE 101 23 717.0).

9. Regarding claim 1, Muller discloses a spindle unit 1 for a machine tool, comprising: a drive unit 3 having a drive shaft (rotor of drive unit 3 as seen in figure 1); a

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spindle head assembly 2 having a hollow spindle head shaft 4 driven by the drive unit; a tie rod 13 arranged for axial displacement in the hollow spindle head shaft 4 between rearward and forward positions and mechanically coupled with the drive shaft (through shaft 4); a collet (not labeled but seen in figure 1) placed in a pocket of the spindle head shaft 4 and interacting with the tie rod 13 to clamp a tool 14 and to expel the tool; a bearing assembly 10 supporting the drive shaft (through shaft 4); and a shifting unit 26 for moving the bearing assembly 10 in an axial direction (through bearing bush 11) to thereby displace the drive shaft together with the tie rod 13 between the rearward and forward positions (see page 11, paragraph starting "Durch den", through page 12).

Muller does not distinctly disclose that the collet clamps the tool when the tie rod assumes the rearward position, and expels the tool when the tie rod assumes the forward position. However, the Examiner takes Official Notice that it is well known in the art for a collet to clamp a tool when the tie rod assumes a rearward position, and expel the tool when the tie rod assumes a forward position. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have designed the spindle unit of Muller to clamp and release the tool as described above.

10. Regarding claim 2, Muller discloses wherein the spindle head assembly 2 and the drive unit 3 are detachably connected to one another, and wherein the drive shaft and the tie rod 13 are detachably coupled to one another (all may be disconnected/decoupled when the assembly is disassembled).

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11. Regarding claim 4, Muller discloses wherein the drive shaft has a central bore (bore in which shaft 4 is located) for transporting a material, said tie rod 13 having a tube 13 extending into the central bore and being removable therefrom

12. Regarding claim 7, Muller discloses wherein the drive unit 3 includes an electric motor having a rotor (see figure 1, drive 3 includes a rotor and a stator) mounted on the drive shaft for conjoint displacement with the drive shaft (see page 10, paragraph starting "Die Zeichnungsfigur").

13. Regarding claim 8, Muller discloses wherein the electric motor includes a stator (see figure 1, drive 3 includes a rotor and a stator) which completely surrounds the rotor independent of a displacement position of the shifting unit.

14. Regarding claim 10, Muller discloses wherein the drive shaft has opposite ends, said bearing assembly having a bearing sleeve 6 for support of one end (right end in figure 1) of the drive shaft (supports the drive shaft through the shaft 4), and another bearing sleeve 5 for support of the other end (left end in figure 1) of the drive shaft (supports the drive shaft through the shaft 4).

15. Regarding claim 11, Muller discloses the invention substantially as claimed, except Muller does not disclose wherein the shifting unit is constructed for operation by one of hydraulic means, pneumatic means, and electromechanical means. However, the Examiner takes Official Notice that it is well known in the art for a shifting unit of this type to be constructed for operation by hydraulic means, pneumatic means, or electromechanical means for the purpose of using a well known actuation method for shifting.

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16. Regarding claim 15, Muller discloses wherein the spindle head assembly 2 is disposed in coaxial relationship to the drive unit 3 (both are centered around the central axis, see figure 1).

17. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muller in view of Kameyama et al. (U.S. Patent 5,009,554).

18. Regarding claim 3, Muller discloses the invention substantially as claimed, except Muller does not disclose the spindle head shaft to be constructed as a spline shaft, or the drive shaft having an end face constructed as a hollow wheel to complement the spline end of the spindle head shaft to enable coupling. Kameyama et al. teaches a spindle head shaft 6 that has one end facing the drive shaft 13b and constructed as a spline shaft 15, and said drive shaft 13b having an end face constructed as a hollow wheel 16 to complement the one end 15 of the spindle head shaft 6 to for the purpose of enabling coupling between the two parts. Therefore it would have been obvious to one having ordinary skill in the art to have combined the spindle unit of Muller with the spindle head shaft and drive shafts of Kameyama et al. in order to have an alternative means of attachment between the two.

19. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muller in view of Chen (U.S. Patent 6,464,435).

20. Muller discloses the invention substantially as claimed, except Muller does not disclose the drive shaft and tie rod to be formed as one piece. Chen teaches a drive



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shaft 42 and tie rod 42 which are formed from one piece for the purpose of simplification of the spindle unit assembly. Therefore it would have been obvious to one having ordinary skill in the art to have combined the spindle unit of Muller with the drive shaft and tie rod combination of Chen in order to have a simpler assembly.

21. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muller.

22. Regarding claim 12, Muller discloses wherein during operation of the spindle unit, the shifting unit 26 is controlled so as to cause the drive shaft to axially contact the tie rod 13 (through contact with shaft 4), and further comprising a sensing device constructed for measuring an axial position of the reference surface 21 and thereby implementing an indirect measurement of an axial position of the tie rod.

Muller does not distinctly disclose that the sensing device is constructed for measuring an axial position of the drive shaft. However, since the drive shaft and the reference surface are interconnected through the spindle head shaft, it would have been obvious to one having ordinary skill in the art at the time the invention was made to directly measure the axial position of the drive shaft instead of the reference surface for the purpose of determining the position of the tie rod and the state of chucking (see paragraph [0025], since it would only involve placing the sensor 19 in a different position in the assembly, and it has been held that rearranging parts of an invention involves only routine skill in the art.

***Response to Arguments***

23. Applicant's arguments with respect to claims 1 and 5 have been considered but are moot in view of the new ground(s) of rejection.
24. For the reasons as set forth above, the rejections are maintained.

***Conclusion***

25. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric A. Gates whose telephone number is 571-272-5498. The examiner can normally be reached on Monday-Thursday 7:45-6:15.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Monica Carter can be reached on 571-272-4475. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



EAG  
24 October 2006



MONICA CARTER  
SUPERVISORY PATENT EXAMINER